

REMARKS/ARGUMENTS

Claims 1-3, 5-14, and 16-21 remain in the application. Claims 1, 5, and 20 have been amended. Reconsideration of this application, as amended, is respectfully requested.

Claim 1 has been amended to specify that a passage is formed through the at least two conducting layers and the at least two insulating layers to expose edges of the at least two conducting layers and the at least two insulating layers, the edges collectively forming a wall or walls of the passage, the exposed edges of the at least two conducting layers forming the working electrode and a second electrode of the electrochemical cell. Support for this amendment can be found at page 3, lines 18-22 of the specification, at page 3, line 32 through page 4, line 7 of the specification, and FIGS. 2, 4, 6, and 8.

Claims 1-3, 5-9, 11, 13, 14, 16, 17, 20, and 21 were rejected under 35 U. S. C. §103 (a) as being unpatentable over by the English language translation of Urban (WO 90/12314 A1). This rejection is respectfully traversed for the following reasons.

Urban et al., WO 90/12314 A1 (hereinafter "Urban et al."), discloses a micro-multi-electrode arrangement for electrochemical measurement and generation of electroactive species, where the electrodes are arranged upon a carrier, characterized in that an internal electrode and at least two additional electrodes are provided with the internal electrode being wired as reference electrode and with the other electrodes at least partly surrounding the internal electrode in the projection upon carrier.

Urban et al. discloses an electrochemical cell having an electrode 1, typically a reference electrode, an electrode 2, insulation layer(s) 4, a counter electrode 3, and an inert carrier 5. See FIGS. 11-13 of Urban et al. According to each embodiment described in Urban et al., one major surface of the electrode 1 is in contact with the inert carrier 5, but the other major surface of the electrode 1 is exposed, i.e., not in contact with the insulation layer 4 or with the inert carrier 5. In addition, electrode 1 is surrounded by the walls of the quasi-cylindrical pore. Claims 1-3, 5-9, 11, 13, 14, 16, 17, 20, and 21, as amended, require that a passage be formed through the at least two

conducting layers and the at least two insulating layers to expose edges of the at least two conducting layers and the at least two insulating layers, the edges collectively forming a wall or walls of the passage, the exposed edges of the at least two conducting layers forming the working electrode and a second electrode of the electrochemical cell. The edges of the essential electrode 1 in the device of Urban et al. do not contribute to forming the walls surrounding the quasi-cylindrical pore. Furthermore, positioning of the essential electrode 1 on the base of the quasi-cylindrical pore in the device of Urban et al. requires the diameter of the quasi-cylindrical pore to be sufficiently large to accommodate the essential electrode 1. By positioning the electrodes in the manner that they are positioned according to claim 1, as amended, it is possible to reduce the diameter of the passage to a very small diameter, which enables the electrochemical cell to require only a very small volume of liquid sample. This benefit is unexpected. For this reason, Urban et al. does not render claim 1, as amended, obvious to one of ordinary skill in the art. Claims 2-3, 5-9, 11, 13, 14, 16, 17, 20, and 21 depend from claim 1, as amended, either directly (claims 2, 5, 8, 9, 11, 16, 17, 20, and 21) or indirectly (claims 3, 6, 7, 13, and 14). For this reason, Urban et al. does not render claims 1-3, 5-9, 11, 13, 14, 16, 17, 20, and 21, as amended, obvious to one of ordinary skill in the art.

Claims 1-3, 5-13, and 16-21 were rejected under 35 U. S. C. § 103 (a) as being unpatentable over Hyland (WO 03/056319 A2). This rejection is respectfully traversed for the following reasons.

Hyland et al., WO 03/056319 A2 (hereinafter "Hyland et al."), discloses an electrochemical cell which, either alone or in combination with a substrate onto which it is placed, is in the form of a receptacle, the cell comprising a counter electrode and a working electrode, wherein at least one electrode has at least one dimension of less than 50 μm , the working electrode being in a wall of the receptacle.

Claims 1-3, 5-13, and 16-21, as amended, require that the electrochemical cell comprise an insulating substrate and a plurality of layers. Claims 1-3, 5-13, and 16-21, as amended, further require that the insulating substrate or at least one of the at least two insulating layers be interposed between the at least two conducting layers. Claims 1-3, 5-13, and 16-21, as

amended, further require that each major surface of each conducting layer be in contact with a major surface of the insulating substrate or a major surface of at least one of the insulating layers. Claims 1-3, 5-13, and 16-21, as amended, still further require that the working electrode be in contact with at least one reagent. Claims 1-3, 5-14, and 16-21, as amended, require that a passage be formed through the at least two conducting layers and the at least two insulating layers to expose edges of the at least two conducting layers and the at least two insulating layers, the edges collectively forming a wall or walls of the passage, the exposed edges of the at least two conducting layers forming the working electrode and a second electrode of the electrochemical cell. According to Hyland et al., at page 10, lines 25-28 of the specification:

The electro-active substance 8 is typically inserted into the receptacle in such a position that the electro-active substance is not in contact with the working electrode. This ensures that fouling of the working electrode is minimised or avoided. [emphasis added]

Thus, Hyland et al. teaches away from claims 1-3, 5-13, and 16-21 of this application as amended. For this reason, it is submitted that Hyland et al. does not render claims 1-3, 5-13, and 16-21 of this application, as amended, obvious to one of ordinary skill in the art.

Claims 12, 18, and 19 were rejected under 35 U. S. C. §103 (a) as being unpatentable over the English language translation of Urban (WO 90/12314 A1), and further in view of Fritsch et al. (US 2003/0015422 A1). This rejection is respectfully traversed for the following reasons.

Fritsch et al., US 2003/0015422 A1 (hereinafter "Fritsch et al."), discloses a three-dimensional microfabricated device wherein edges of a lipid bi-layer are anchored by alkanethiol derivitized inner edges of gold layers in an etched region of insulator and wherein a bottom of the device is lined with an insulator layer.

Claims 12, 18, and 19, as amended, require that a passage be formed through the at least two conducting layers and the at least two insulating layers to expose edges of the at least two conducting layers and the at least two insulating layers, the edges collectively forming a wall or walls of the

passage, the exposed edges of the at least two conducting layers forming the working electrode and a second electrode of the electrochemical cell. The edges of the electrode 1 in the device of Urban et al. do not contribute to forming the walls of the quasi-cylindrical pore. Furthermore, positioning of the electrode 1 on the base of the quasi-cylindrical pore in the device of Urban et al. requires the diameter of the quasi-cylindrical pore to be sufficiently large to accommodate the electrode 1. By positioning the electrodes in the manner that they are positioned according to claim 1, as amended, it is possible to reduce the diameter of the passage to a very small diameter, which enables the electrochemical cell to require only a very small volume of liquid sample. This benefit is unexpected. For this reason, Urban et al. alone does not render claim 1, as amended, obvious to one of ordinary skill in the art. Because claims 12, 18, and 19 require all of the features of claim 1, as amended, Urban et al. alone does not render claims 12, 18, and 19 obvious to one of ordinary skill in the art.

As noted by the Examiner, Fritsch et al. does not disclose or suggest that that the cavity electrode system described therein has a working electrode in contact with at least one reagent. Claim 1, as amended, requires that the working electrode be in contact with at least one reagent. Claims 12, 18, and 19 include all of the features recited in claim 1, as amended. For this reason, Fritsch et al. alone does not render claims 12, 18, and 19 obvious to one of ordinary skill in the art.

As stated previously, claims 12, 18, and 19, which depend from claim 1, as amended, require that each major surface of each conducting layer be in contact with a major surface of the insulating substrate or a major surface of at least one of the insulating layers. Urban et al. does not disclose or suggest this feature. As stated previously, Fritsch et al. does not disclose or suggest that that the cavity electrode system described therein has a working electrode in contact with at least one reagent. Thus, Fritsch et al. teaches away from claims 12, 18, and 19, which depend from claim 1, as amended, because claims 12, 18, and 19 require that the working electrode be in contact with at least one reagent. Accordingly, the combination of Urban et al. and Fritsch et al. teaches away from the present invention. In effect, the rejection is based on a piecemeal reconstruction of the prior art, which is

impermissible, because it is impermissible within the framework of 35 U. S. C. § 103 to pick and choose from any one reference (i.e., Fritsch et al.) only so much of it as will support a given position (i.e., small volume of sample required), to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art (working electrode required to be in contact with a reagent).

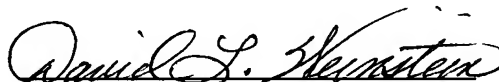
For the foregoing reasons, the combination of Urban et al. and Fritsch et al., which is impermissible, fails to render claims 12, 18, and 19 obvious to one of ordinary skill in the art.

In view of the foregoing, it is submitted that claims 1-3, 5-14, and 16-21, as amended, are in condition for allowance, and official Notice of Allowance is respectfully requested.

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